

Making Your Garden Bush Friendly

How to recognise and control garden plants which invade bushland in Sydney and coastal NSW

Expanded 3rd edition
new methods section
more weeds

Lynne McLoughlin and Judith Rawling

Further Information

The plants described in this booklet are a selection of the many noxious and environmental weeds found in Sydney's bushland and bushland in coastal New South Wales. The plants listed include some of our worst weed problems, and are representative of those plants most likely to be found in home gardens.

For further information about environmental/noxious weeds and their eradication:

- ▶ NSW Agriculture - website: <http://www.agric.nsw.gov.au>
- ▶ The Noxious Weeds Officer, Bushcare Officer or Bushland Management Officer at your Local Council
- ▶ Urban Bushland Management Consultants P/L. Ph: 02 9894 2255. Email: ubmc@ozemail.com.au
- ▶ The Noxious Weeds Advisory Committee: The Secretary, Locked Bag 21, Orange 2800
- ▶ Noxious Plants Advisory Officer (Sydney Region), Locked Bag 11, Windsor 2756. Ph: 0245 770 600
- ▶ The NSW Environmental Protection Authority, see <http://www.epa.nsw.gov.au/envirom/#pest>
Also the EPA Registrar of Pesticides.
- ▶ You can also subscribe on email to: Enviroweeds@majordomo.nre.vic.gov.au

Further Reading

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The Weed Problem

A growing number of exotic plants in Sydney's suburban gardens threaten the very survival of our native bushland: these are the **environmental weeds**. Originally imported for ornamental, agricultural or soil conservation purposes, these bush invaders destroy remnant urban bushland by overwhelming the native flora. They thus destroy native plants, degrade fauna habitats, make access difficult and the bush visually unattractive. Some of these bush invaders are old garden favourites, but new, potentially invasive garden plants are introduced to the market each year.

The most common bushland weeds are soft-leaved plants which thrive in bush soils dramatically changed by runoff from urban areas. Bushland invaders are favoured by these damp nutrient-enriched soils. With their prolific seeding habits and free from their natural predators, they have a big edge on our own plants.

Environmental weeds invade bushland in a variety of ways. The table below explains how YOU can help stop their attack on our bushland.

Seed blown by wind eg Crofton Weed, Pampas Grass	Remove these plants from your garden if you live within one kilometre of bushland.
Seed carried by birds and other animals which eat fruit, particularly from plants with berries, and drop the seed later eg Privet, Camphor laurel, Lantana	Remove these plants from your garden if you live within 500m of bushland. Check your garden regularly for seedlings along fence lines and under trees where birds perch. Pull out immediately.
Seeds or plant parts carried by water from stormwater drains into natural creek systems. Most plants can invade bush this way	Never leave weed piles or garden debris near a creek edge where a sudden storm surge can wash it downstream. When weeding in a creekline, keep weed piles out of the flood zone. Ensure compost heaps are contained in a covered bin and no material escapes.
Creeping menace of vines, scramblers and creepers, eg Morning Glory	These spread very rapidly from gardens into adjacent bushland smothering everything. Remove totally if you live next to bush.
Plant parts dumped in bushland which grow easily from fragments eg climbers, creepers, scramblers, grasses, succulents	Dispose of all your garden debris by composting, or by contacting your Council for arrangements in your area for disposing of non-compostible garden material.

Remember any plant that grows and spreads quickly in your garden will do the same thing in the bush. Garden refuse does not improve the soil; nor does it "fertilise" the native plants - but it will eventually kill them! Always dispose of unwanted garden material responsibly. Never dump garden refuse in the bush, and be alert. Notify your local Council if you see anyone dumping or damaging plants in bushland.

Whether you live near bush or not, animals, birds, wind and water can carry seed from your garden into the bush.

MAKE YOUR GARDEN BUSH FRIENDLY!

**Eliminate the seed source from your garden
Don't plant potentially invasive exotics
Never dump garden refuse into the bush**

The Privets

Broad-leaved Privet (*Ligustrum lucidum*)

Small-leaved or Chinese Privet (*L. sinense*)

Originally from Asia, Privet was once popular as a hedgerow plant in formal parks and gardens. Found throughout Sydney's bushland, particularly in moist gullies and watercourses, it is now a threat to the survival of many native plant communities. Privet fruits prolifically and the succulent berries are widely dispersed by birds. Seeds germinate easily and young Privets grow aggressively, displacing native understorey species.

The pollen of both species contributes to asthma and hay fever attacks in spring and early summer. Privet is declared as a noxious plant in many local council areas.

Broad-leaved Privet is a small tree but grows larger in favourable conditions. The dark green leaves, up to 12cm long, have wavy edges and are arranged in pairs on the stem. In early summer, heavily perfumed sprays of small white flowers form on the ends of the branches. The fruit ripens in late autumn and winter as grape-like clusters of small purple-black berries. The smooth bark has many raised corky pores, which give the stem a bumpy appearance.

Broad-leaved Privet can be confused with native look-alikes such as Lillypilly (*Acmena smithii*) and Sweet Pittosporum (*Pittosporum undulatum*). However, Pittosporum berries are orange and its leaves are alternate, often with small oval "scabs" caused by a leaf insect. Lillypilly has white to pink large, fleshy fruits and its aromatic leaves have tiny oil glands, which are clearly visible when held up to the light.

Chinese Privet is a small, shrubby plant, which forms dense multi-stemmed stands up to 3m in height. The leaves are yellow-green to green, up to 7cm long, with wavy edges. The flowers resemble Broad-leaved Privet, but Chinese Privet flowers in spring. Clusters of dark purple berries ripen in winter, providing a food source for birds and other animals.



Broad-leaved Privet with berries



Chinese Privet in flower

Eradication

Help control the spread of Privet by removing all mature plants from your garden and checking for new seedlings each spring. Privet re-shoots from cut stems or from roots left in the soil. Lopping, burning or ringbarking Privet without treating the stumps with herbicide is ineffective. Privet may be dug out, using a mattock or crowbar. However, you must remove ALL of the root system. Broad-leaved Privet (stem diameter <3cm) is quite easy to pull up, but Chinese Privet has tenacious roots which tend to break off when pulled. If you opt for chemical control, Privet is easily controlled with glyphosate. See Methods section for removing woody weeds and using herbicide via cut-stump, frilling and tree injection.

Camphor Laurel

(*Cinnamomum camphora*)

A native of China and Japan, Camphor laurel grows to a ripe old age, forming a large spreading tree. Widely planted in parks, gardens and as street trees in older suburbs, it has invaded bushland in Sydney and coastal NSW. Its seeds are spread widely by birds.

Camphor laurel appears to produce a chemical inhibitor, which prevents the growth of other plants, including its own seedlings, under its canopy line. Camphor trees cast heavy shade and have extensive root systems, so that they dominate their immediate area and exclude most other vegetation.

The rough-barked, dark grey trunk has prominent vertical cracks, but small branches are smooth olive-green. Twigs are often red. Oval-shaped leaves are glossy bright green on the upper surface and dull green below, with prominent veins. Crushed leaves have a distinctive camphor smell. The insignificant white flowers bloom in October, and its small black berries ripen from autumn to early winter.



Glossy Camphor laurel leaves with distinctive red stems

Eradication

As a large tree Camphor laurel is difficult to remove, and it often re-shoots after poisoning, cutting or burning. The only effective physical method is total removal of the root system. Use of herbicide is advised for a complete root kill.

Gorse

(*Ulex europaeus*)

Grown for its bright yellow pea-flowers and as a hedging plant in rural areas, Gorse has spread alarmingly to become a problem of epic proportions in Tasmania and the Blue Mountains. Spread along walking trails and watercourses, it forms large thickets deep in gorges and valleys, and makes fire management more difficult. It is declared 'noxious' in many parts of the State.

Gorse is a fast-growing, very prickly, evergreen shrub to about 5m, with narrow, grey-green spiny leaves. It flowers twice, in spring and autumn, then produces oval, greenish-brown hairy pods that 'explode' when ripe, scattering seed for several metres around. Seed can live up to 40 years and accumulates in the soil, germinating with any disturbance, especially fire.

Eradication

Adult plants can be eradicated fairly easily (hand or machine removal, herbicide use), but it grows easily from seed for some years, so monitor and remove new seedlings quickly. Use thick mulch and over-plant to help suppress seed germination.



Gorse in flower

Ochna - Mickey Mouse Bush or Bird's Eye Bush

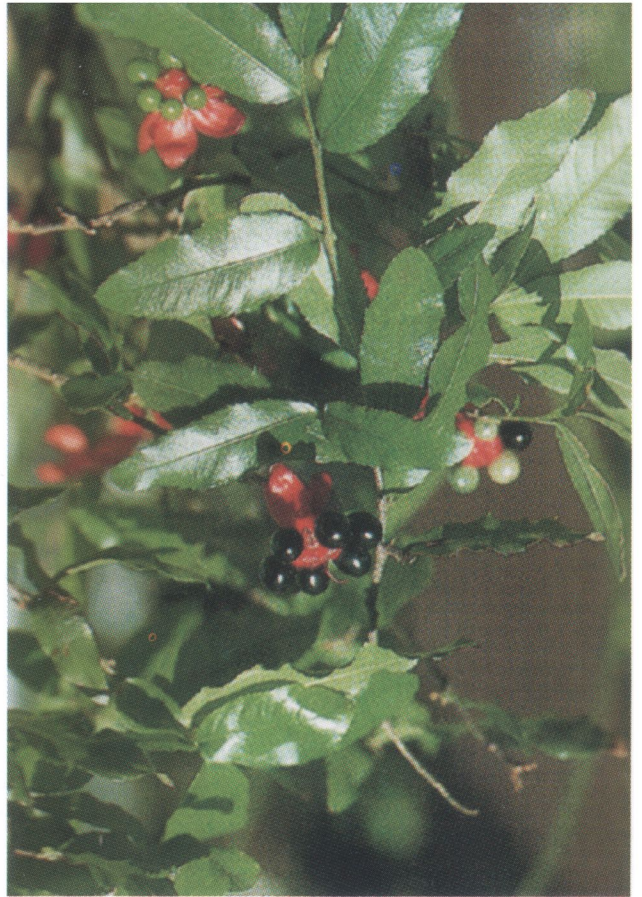
(*Ochna serrulata*)

A native of South Africa, Ochna is a common garden escape in the Sydney area. Still a popular ornamental plant, it has naturalised in bushland as the copious supply of seeds in suburban gardens is readily available to foraging birds.

An angular shrub up to 2m, Ochna has light brown, slightly rough stems and small curvy leaves with finely serrated edges. New bronze leaf growth appears in spring, at the same time as the bright yellow flowers. The petals fall, and the fruit forms the familiar "Mickey Mouse" face as the upper sepals turn bright red, and the berries below ripen to black.

Eradication

Ochna is difficult to eradicate. It has a tenacious tap root system - even tiny seedlings resist hand pulling. Small pieces of root will reshoot, so you must dig out all the roots. Remove new seedlings as they appear, before they take firm hold. To use herbicide, cut through the main stem and scour the bark below the cut with a sharp knife. Apply undiluted herbicide liberally to all exposed surfaces, even for seedlings.



Ochna

Blackberry

(*Rubus fruticosus*)

Originally from Europe, Blackberry is now spread world wide. Birds, foxes, other animals and people eat the fruit, so it has become a common weed throughout temperate Australia. Growing along streambanks and in boggy paddocks, it has been a declared noxious weed in NSW for many years. There are a several native *Rubus* species in the Sydney area, but these generally are not troublesome.

Blackberries are woody shrubs up to 5m high, with prickly scrambling stems up to 6m long. Stems often root at the tips to form tangled thickets. The rough leaves are divided into 3-5 serrated leaflets. Pink to white flowers form in clusters. A food source for many animals, black berries ripen in late summer.

Eradication

Blackberry thickets can be slashed or burnt but will regrow from rootstock. Roots must be dug out or poisoned. Canes may be cut at ground level and poisoned (cut-stump) but thickets with a larger leaf area respond well to spraying. There are several herbicides registered for use on Blackberry so check with your local Council or NSW Agriculture. For best results, spray in mid to late summer, between flowering and fruiting, and be prepared to treat regrowth for several years.



Blackberry in flower

Bitou Bush and Boneseed

(*Chrysanthemoides monilifera* ssp. *rotundata*)

(*Chrysanthemoides monilifera* ssp. *monilifera*)

Bitou Bush was first imported into Australia to stabilise coastal sand dunes around Newcastle and this yellow daisy bush has now become part of many a seaside garden. An erect, densely branched shrub, it grows up to 3m high. The alternate leaves are broad, with a serrated edge and a pointed tip, often carrying tufts of white down. There are two sub-species, differentiated by their leaf and the berry-like black fruit. Bitou Bush is widespread along the coast, where it is well established on dunes and headlands. It also invades wetlands and open forests. Boneseed occurs on drier soils further inland on the central tablelands and in western NSW. Considered one of Australia's worst environmental weeds, Bitou Bush is the focus of many Bushcare and Dunecare programs.



Bitou Bush in flower

Eradication

Bitou is easy to dig out, but also responds readily to glyphosate. Each stem or runner must be treated, and all roots removed. Fire kills adult plants but seeds last many years in the soil, often germinating after fire as a carpet of seedlings. These may be controlled with 1:100 glyphosate spray. Bitou is noxious in coastal councils in NSW and is listed as a weed of 'national significance'



Firethorn

The Berry Bushes

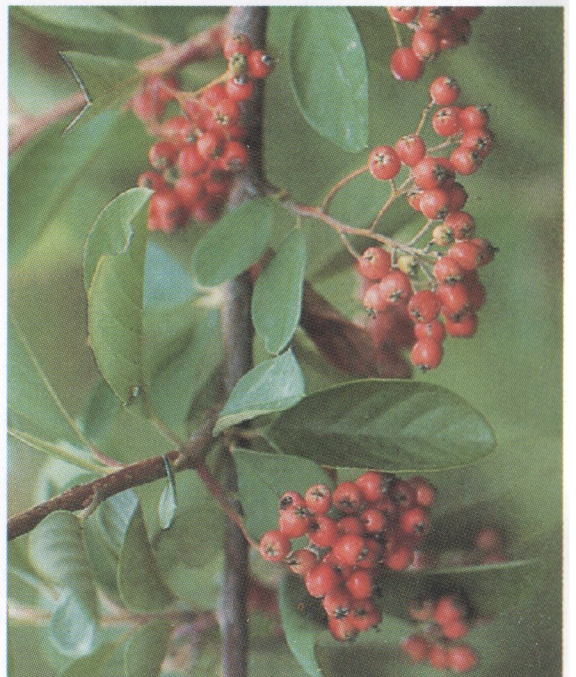
Cotoneaster (*Cotoneaster glycophylla*)

Firethorn (*Pyracantha* spp)

These hardy garden plants are grown for their brightly coloured winter berries, and are often used as hedgerows. Unfortunately, birds like the succulent fruit, and have spread these plants far and wide. Although they grow best in cool climates, they also berry prolifically in warm coastal districts. Cotoneaster is a tall shrub or small tree, growing to 3m or more with long arching stems. Its small elliptical leaves vary from dull grey-green to bright green from a shady position to full sun. There are several varieties, including a popular prostrate form. Firethorn is a sprawling shrub, with narrower leaves and long sharp thorns on the branches. Both have tiny white flowers which appear in spring, and berries which range from yellow to orange to brilliant red.

Eradication

Both species are environmental weeds on the Central Tablelands and in the ACT. In Sydney, they are scattered in bushland, but the seed source in gardens ensures a continuing invasion. Replacing garden plants will reduce the seed source and protect the bush. To remove, use methods for woody weeds or herbicide application by cut-stump, frilling or tree injection.



Cotoneaster in fruit

Lantana

(*Lantana camara*)

Lantana is a common weed of pastures, forests, roadsides, creeks and disturbed land. There are many benign cultivars used in gardens, but the common red and pink forms are declared noxious weeds in many parts of NSW, including the Sydney area. The red form is toxic to cattle and sheep. The pink form is a major bushland weed on the Central Coast.

The green fruits of both forms can be poisonous and the sharp prickles and hairy leaves may cause allergic reactions. Lantana alters soil chemistry and structure, interfering with nutrient recycling and inhibiting native plant regeneration. It has a remarkable growth rate, especially in wet weather, displacing all other plants. Growth of Lantana up into the tree canopy encourages fungi and other pathogens, and is a contributing factor to dieback and death of native trees.

Lantana is a scrambling shrub up to 4m high with square prickly stems. Plants frequently root where side stems touch the ground, forming extensive interconnected thickets. The rough leaves are mid-green with slightly round-toothed edges, and they have a distinctive "sharp" smell, which distinguishes them from the native look-alike, Poison Peach (*Trema aspera*). Lantana flowers throughout the year, with pink, red or yellow flowers clustered in dense heads at the end of long stalks.

Eradication

Being shallow-rooted, Lantana is easy to pull out, but all large surface roots must be removed or they will re-shoot. Do not leave branches on the ground or they may take root. Cut and paint stems or spray large clumps with a registered herbicide. Glyphosate works well at a rate of 1:100 when sprayed in summer over maximum leaf area. Dead clumps may be left to rot or bashed down and compacted prior to burning. Lantana is difficult to burn as the wiry stems retain moisture. Re-sprouting will occur if it is burnt without using herbicide to kill the roots.

African Olive

(*Olea europaea* var. *africana*)

Grown as a garden ornamental and a hedgerow species, African Olive has become a major environmental weed, particularly on clay soils in Western Sydney. It grows in most situations - full sun or heavy shade, moist or dry conditions. Foxes and birds eat the small black "olives" as a staple food.

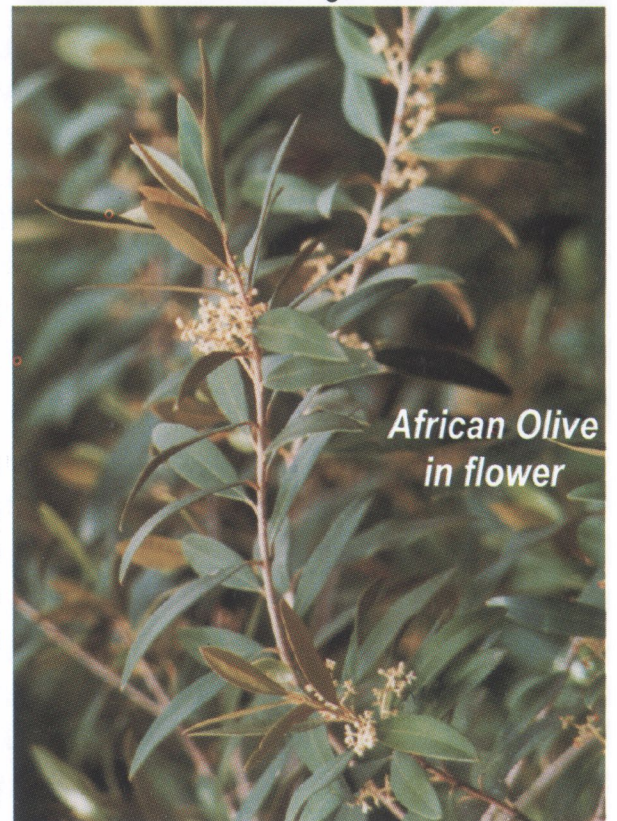
A small evergreen tree, African Olive has drooping branchlets and dark green lance-shaped leaves, 5-10cm long with a recurved tip. Younger leaves have tiny brown scales on the underside. White tubular flowers form in late spring at the junction of the stem and leaves. Its succulent green berries ripen to black from late autumn to winter.

Eradication

Complete removal of the root system is advised. Olives resprout prolifically if lopped or burnt. Treat with herbicide for total root kill.



Lantana in flower



*African Olive
in flower*

Rhus or Wax Tree

(*Rhus succedanea*)

A native of China and Japan, *Rhus* is grown for its spectacular autumn foliage. However, many people suffer severe allergic reactions when they come into contact with its sap or leaves. *Rhus* is declared noxious in all of NSW and must be removed from gardens. It is a minor weed problem in Sydney bushland.

Rhus grows as a large deciduous shrub or small tree up to 8m tall. Its dark green leaves consist of 7-15 leaflets. The creamy yellow flowers are very small, appearing in spring just after the new leaves. Large clusters of fruit ripen to a tawny colour between May and September. The fruit is eaten by a wide variety of birds and other animals.

Rhus can be confused with harmless Chinese Pistachio, but *Rhus* leaves end in a single leaflet, Pistachio's in a leaflet pair. Additional information on identification can be found on NSW Agriculture's website, <http://www.agric.nsw.gov.au>.



Eradication

Rhus should be handled very carefully. The sap is dangerous, so wear protective clothing. Dig out roots after the leaves have fallen. Do not burn the dead plant, as the smoke may be dangerous.

The Brooms

Scotch/English Broom (*Cytisus scoparius*)

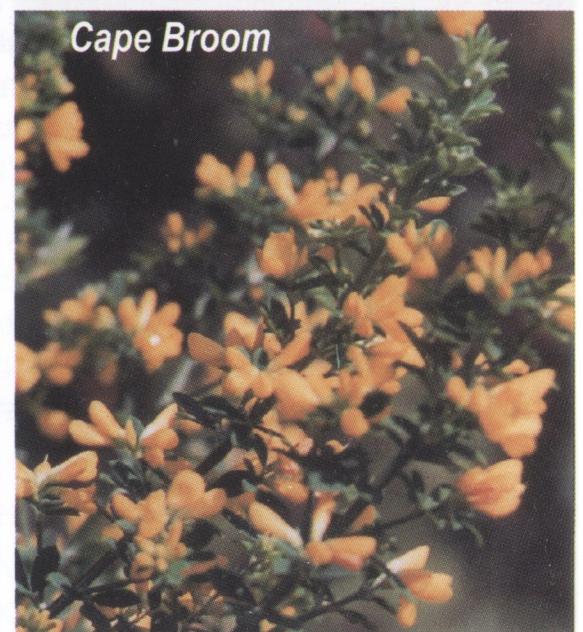
Cape Broom / Teline (*Genista monspessulana*)

The Brooms are among the most serious and widespread environmental weeds in NSW, thriving on dry low-nutrient soils in sunny locations in urban bushland and wilderness. *Cytisus* (from Europe) and *Genista* (from the Mediterranean) are both erect shrubs with ridged woody stems. Both have three-part leaves, but *Cytisus* leaves are greatly reduced, almost scale-like. Both have bright yellow pea flowers and bear brown or black seed pods, which contain up to 6 hard-coated seeds each.

Broom has very long-lived seed which accumulates in the soil. Any disturbance, such as fire, stimulates seed germination. Seed is long-lasting, and may germinate intermittently for many years.

Eradication

Dig it out, roots and all, or use cut-stump method. To suppress seed germination, mulch thickly after weeding and monitor the regrowth. After fire, be ready to deal with heavy seedling growth. For the best results, treat Broom while pods are green, before it sets seed (in winter or early spring).



Green Cestrum or Green Poison Berry

(*Cestrum parqui*)

Cestrum is widely spread through eastern Australia, and is declared noxious in many parts of NSW and Victoria. Imported as an ornamental from the Americas, it is highly attractive to birds and seedlings are often found growing under perching trees, along fencelines, on creekbanks and in stunted thickets under large trees. All forms of Cestrum are highly poisonous to stock and should be removed from properties grazing horses or cattle.

Commonly a straggling shrub up to 2m high, Cestrum has trumpet-like greenish-yellow flowers in summer and black berries in autumn. *C. aurantiacum* is an orange-flowered form, which is also a weed problem along the coast. Brightly coloured hybrids available from garden centres do not seem to set viable seed and are presumably safe to plant in the garden.

Eradication

Eradication is difficult as the plant suckers if the stems are cut without first poisoning the rootstock. Treat individual plants using the stem-scape/herbicide method. Tree injection is also effective. Use Access or Garlon, rather than glyphosate (Round-up) for better control. Large thickets may be removed with a backhoe if the regrowth is treated promptly.

Cassia or Arsenic Bush

(*Senna pendula*)

There are 9 species of Cassia in the Sydney region, but some species are native. Cassias all have pinnate leaves (leaves made up of a number of leaflets), but the number of leaflets varies between species.

The weedy Cassia from tropical America is found scattered in bushland. It grows as a multi-stemmed shrub up to 3.5m tall. Stems and leaves are hairless, with three opposite pairs of leaflets in each leaf. The small leaflets are almost elliptical, with a gland between the lowest pair. Its bright yellow flowers have five petals, and the hard black seeds are held in long bean-like pods which ripen in winter.

Cassia is often confused with a native shrub, *Breynia oblongifolia*, as their leaves are similar, but Cassia leaflets grow in opposite pairs, while *Breynia* leaves are alternate

Eradication

Herbicide methods can be used, but Cassia is easily dug out. Remove all roots and dispose of the large seed pods which are eaten by birds and other animals.



Cestrum flower buds open to a star-shaped tubular flower



Cassia - flower and pods

The Asparagus "Ferns"

Ground Asparagus

(*Protasparagus aethiopicus* var *densiflorus*)

Bridal Creeper (*Myrsiphyllum asparagoides*)

Climbing Asparagus

(*Protoasparagus plumosus*)

Often referred to as 'ferns', Asparagus actually belongs to the Lily family. Originally imported from South America, several varieties are grown as ornamentals. The attractive red berries are widely dispersed by birds, but infestations in bushland often occur from dumping of garden refuse, especially around older suburbs.

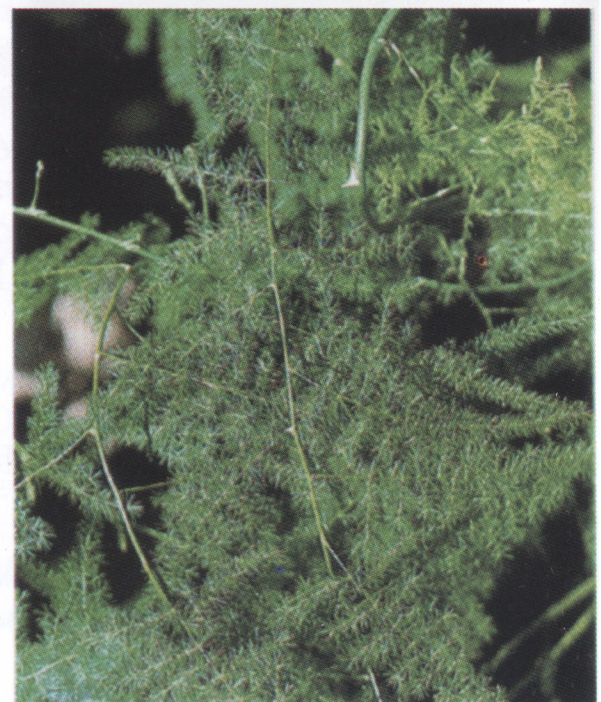
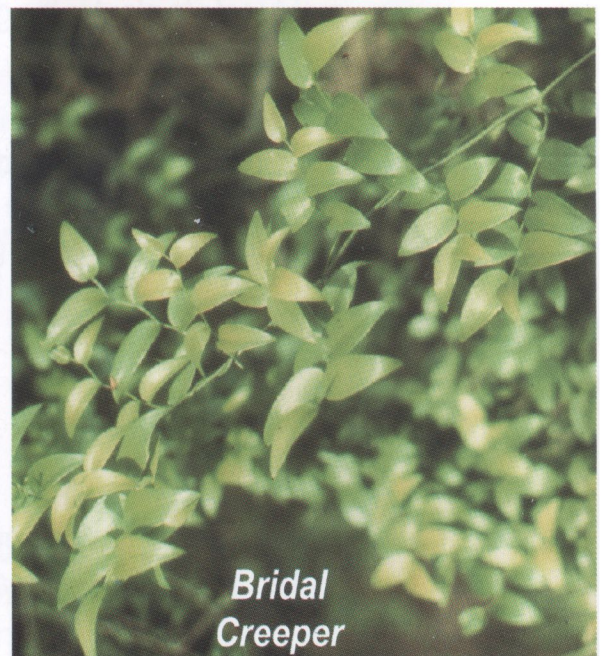
Ground Asparagus (or **Asparagus Fern**) is a dense scrambler with pink flowers, red berries and spiny mid-green scales replacing the leaves. The green arching stems have sharp prickles and may grow up to 2m long. Berries ripen in late winter and spring. In Sydney, Ground Asparagus is possibly the most damaging weed growing in Sydney Harbour National Park.

Bridal Creeper (or **Baby Smilax**) is a woody scrambler with small lance-shaped leaves, often found along creeks. Florists prize its sprays of sweet smelling white flowers. Each petal has a distinctive central green stripe. The fruit is a small black berry. Its root system is a complex of starch-storing tubules attached to a horny flat crown.

Florists and some home gardeners also favour **Climbing Asparagus**. It has wispy dark green leaves and sharp thorns. It can climb tall trees and scramble through the canopy. It is a major weed problem in the rainforests of Lord Howe Island and on the north coast of NSW.

Eradication

Asparagus species are best removed manually. Cut away the prickly stems and carefully bag all the berries, as even green ones will ripen if left lying on the ground. Use the 'Pudding Basin cut' to remove the horny crown at the base of the stems. The water "bubbles" attached to the roots need not be removed. However, when removing Bridal Creeper, be sure to remove all the root system, including the flattened horny crown.



Climbing Asparagus

The Pampas Grasses

(*Cortaderia selloana*, *C. jubata*)

Pampas Grass is widespread in coastal NSW, especially on cleared or disturbed sites. The leaves are flammable when dry and large infestations may increase bushfire hazard. Snakes and funnel web spiders like to live in the tussocks. Pampas competes strongly with other plants, while its knife-edged leaves are a safety hazard on bush tracks and in home gardens.

Declared a noxious weed across NSW, Pampas was once a prized garden plant. It is a long-lived perennial in a large tussock over 1m diameter at the base and over 2m high. It has long narrow yellow-green to grey-green leaves. Spectacular flower heads, up to 3m high, are produced in late summer in two sex forms on separate plants - white, fluffy females and yellow/pink/mauve, almost hairless, bisexuals. Both set up to 100,000 seeds per plume, with up to 50 plumes per mature tussock.

The tiny seeds can travel 40 km or more on wind currents, or float, spreading down creeks and drainage lines. Pampas Grass is also spread from fragments included in garden rubbish or dumped along roadsides. All parts of the tough root system (rhizomes) are capable of growing into a new plant.



Pampas Grass in flower

Eradication

Small plants can be hand-pulled, but large tussocks should be grubbed out after slashing back the sharp leaves. Burn the tussock or take it to the tip. Burn using diesel or sump oil, but this is messy and sometimes unsuccessful. Glyphosate spray works well as a foliar spray if used in the growing season, usually summer, on a still cool day. Cover the leaf surfaces and get as much herbicide as possible into the centre of the clump. For large tussocks several applications may be necessary. Spot spray young plants.

Veldt Grass

(*Ehrharta longifolia*, *E. erecta*)

Imported from South Africa, the Veldt Grasses are known as 'pasture weeds', but they are also widespread in gardens and urban bushland. They seed prolifically, spreading via wind, water, on animal fur, bird feathers and walkers' socks. *E. longifolia* (an annual) and *E. erecta* (a perennial) have quite narrow, delicate leaves and long fine flower stalks which set many tiny but sticky seeds. Ehrharta forms a large spreading plant which overshadow other more desirable herbs.

Eradication

Plants are shallow-rooted and easy to remove by hand, or controlled with a spray of dilute glyphosate. When disturbed or exposed to light, *Ehrharta*'s long-lived seeds germinate rapidly. It is essential to suppress new growth with mulch or leaf litter, or place weed matting after clearing.



Ehrharta

Crofton Weed and Mist Flower

(*Ageratina adenophora*, *A. houstonianum*)

A native of Mexico, Crofton Weed is an aggressive non-woody plant which disperses its fluffy seeds by wind. It grows well in sun or shade. It is usually found in damp areas, along creeks or in places where natural drainage has been altered, such as roadsides, along tracks and at outflow points of stormwater drains. Crofton is highly toxic to horses, and can readily kill if enough is eaten.

Crofton grows as a bushy plant, 1-3m high, in a cluster of long upright stems covered with short reddish hairs. Its large, floppy triangular leaves have serrated edges and long stems. White flowers cluster in dense terminal heads, which form a spectacular display in early spring. Crofton is closely related to Mist Flower (*A. houstonianum*) and Blue Billy Goat Weed (*A. riparia*) - both are serious pasture weeds.

Eradication

Crofton and Mist Flower are quite easy to pull out, provided the ground is moist. However, if the area is boggy the site will quickly become re-infested. Seed is spread by water and wind. Fix the drainage problem which allowed the weed to establish in the first place to fully control Crofton and Mist Flower. Both species are declared noxious weeds in many local council areas.



Crofton Weed in flower

Asthma Weed or Pellitory

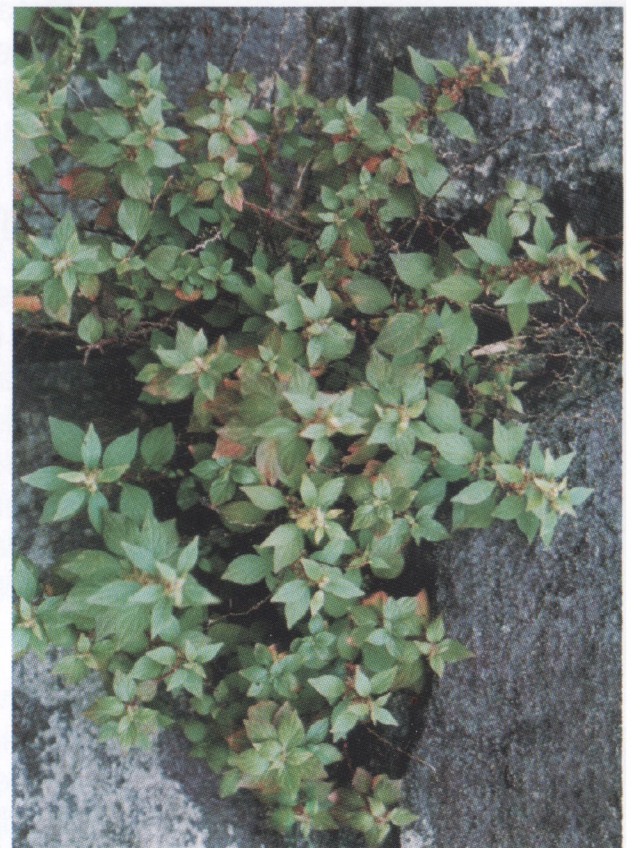
(*Parietaria judaica*)

Pellitory is a weed of roadsides, embankments and old stone walls. It is often found in older neglected gardens in Sydney, although it has expanded westward as far as the Blue Mountains in recent years. Its copious wind-borne pollen has been implicated in several serious respiratory diseases. It has been declared noxious in a number of Sydney council areas.

Pellitory is a soft sprawling perennial herb, closely resembling its larger relative, the Stinging Nettle. It grows to 60cm high with leaves 1-4cm long. Both stem and leaves are covered with tiny hairs, which cling to clothes. Inconspicuous green flowers grow as clusters in the axis of the leaf and stem.

Eradication

The shallow-rooted plant pulls out of the soil easily, but do not attempt this when the plant is flowering as pollen will scatter into the air. Wear a dust mask and gloves to avoid any allergic reaction.



Asthma Weed or Pellitory typically growing in cracks in a stone wall

Coreopsis

(*Coreopsis lanceolata*)

Coreopsis is a bright yellow daisy that carpets rural roadsides in spring and early summer. When the roadsides bloom it is hard to accept that this beautiful golden daisy is a weed. But this short-lived perennial from the American prairies is now a widespread environmental weed on poor soils and in open grassland and woodland. Like all daisies, *Coreopsis* seeds prolifically. Its tiny seeds get caught up in dust and wind currents, spreading rapidly along roads and railway tracks. It has long, lance-shaped basal leaves and bright golden yellow flowerheads, borne on stems up to 60cm in height. After flowering it sets large ball-like fruit. Coreopsis also spreads vegetatively, via underground rhizomes, and forms interconnected mats.

Eradication

Hand weeding is successful, although tedious, as every sister plant must be traced out and removed. For quicker results, use glyphosate as a foliar spray. Treatment is most effective immediately after the flowers have faded and before fruit set. As a member of the daisy family, seeds are long-lived so be prepared to weed out new seedlings every year.



The flower stems of Coreopsis sit high above the foliage as the flowers turn towards the sun.

Fishbone Fern

(*Nephrolepis cordifolia*)

One of the few ferns to be listed as a weed, Fishbone Fern is commonly found in old gardens, along creekbanks, and in sheltered bushland areas. As a fern it produces no flowers. Its spores, which are held on the under side of the fronds, spread on the wind. It also spreads vegetatively from its thin wiry underground rhizomes. Fronds grow to 1m, with large clumps growing outwards from a central core within a short time. Many 'water bubbles' are attached to the dense rhizome network, and the root system spreads to effectively seal off the soil surface and reduce the penetration of rainwater.

Eradication

Herbicide control is successful if a surfactant is used, but it is probably easier to dig out the whole plant. The 'water bubbles' are harmless, but they are closely attached to the growing rhizomes, so remove all the rhizomes and their water bubbles. Dispose of debris carefully and systematically weed out new growth.



Fishbone Fern spreads very quickly to take over the ground surface

Impatiens or Busy Lizzie

(*Impatiens walleriana*)

This colourful and hardy succulent is a popular, low-cost plant for shady gardens, but it seeds prolifically and will take over unless carefully managed. Tolerant of shade and filtered sun, Impatiens has naturalised along many urban watercourses as its brittle stems are easily broken and carried downstream by floodwaters.

Impatiens has soft deep green serrated leaves and flowers consistently over much of the year. Flower colours vary from red through pink to purple. Hybrid varieties include dwarf forms and variegated flowers.

Eradication

Removal is easy - just pull the plant up and compost. However, the hundreds of tiny seeds, which 'explode' from the seed capsules, will germinate rapidly and cover the site once again. Remove the whole plant, bag the debris and watch for new seedlings..



Impatiens flowers prolifically and consistently

Wandering Jew

(*Tradescantia fluminensis*)

Wandering Jew is a familiar but unwelcome intruder along local watercourses and in sheltered bushland gullies. It establishes easily when unwanted garden plants are dumped, and is readily dispersed by water. A fast grower, Wandering Jew scrambles over the ground to form a dense smothering mat. This succulent herb grows best in damp, shady places, but it also tolerates moderate sunlight. Once established, it is very difficult to eradicate. The sap also causes dermatitis in humans and dogs.

The weed has long brittle trailing stems, with prominent leaf nodes which give rise to new plants if pieces are broken off. Leaves are shiny, mid to dark green with a few fine hairs at the base. The white flowers form a cluster at the end of the stem. It has a network of fine roots just under the soil surface which makes it easy to pull out.

Wandering Jew is often confused with the native Scurvy Weed (*Commelina cyanea*), but Commelina's flowers are bright blue, the leaves are narrower, and the roots are thick and fleshy.

Eradication

Herbicide is often ineffective, although some people report success by spraying early in the growing season (early spring) with 1:100 glyphosate, followed by a second treatment 4-5 weeks later. The plant is easy to hand pull or rake, but is difficult to completely eradicate on the first attempt. As the stems shatter easily, all fragments must be removed to prevent re-shooting. Because the root system is very shallow, on hard surfaces it may be rolled up like a carpet and bagged for disposal. Repeated weeding will be necessary in most situations.



Wandering Jew in flower

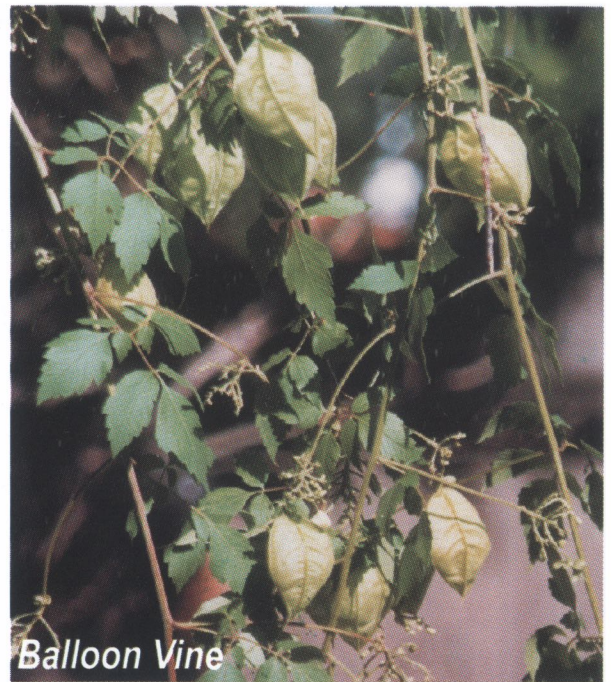
Ornamental Vines - Climbers and Scramblers

Rampant growth of weedy vines and scramblers threatens the survival of native bushland, especially along watercourses. Dumping is often the cause of vine infestations in bushland, although some species have succulent berries which are spread by birds and other animals. Once established, vines climb upwards, reaching for the light, and form smothering canopies over even the tallest trees. Vines hang down from trees in thick curtains and romp over the ground, destroying most plants in their path. Many of the worst weedy vines develop new roots and shoots from growing points clustered along the stems. Every broken piece can become a new plant.

Unchecked vine growth kills other plants by covering the leaves, blocking off the sunlight they need for growth. Evergreen vines also create a warm, moist blanket around trees, encouraging fungal diseases of the bark and roots. This weakens the tree and it becomes vulnerable to stem borers and other predators. At least 9 species of introduced vines are serious environmental weeds in the Sydney area. Of these, the species that cause the most problems are Morning Glory, Balloon Vine, Madeira Vine, Honeysuckle and Cape Ivy. Some vines root at the stem nodes, forming new plants from even small stem segments left in the soil.

Japanese Honeysuckle (*Lonicera japonica*) and **Jasmine** (*Jasminum polyanthum*) are popular ornamentals grown for their sweet-smelling spring flowers. Both species root at the leaf joints (nodes), and both are scramblers which grow entwined with other plants, making them difficult to remove. They have thin green stems, which thicken and grow woody with age. Honeysuckle leaves are usually lobed or toothed. Its flowers are yellow/white with a pink-tinged tube. Jasmine bears clusters of white flowers with pink stems. Spring-flowering Jasmine is often implicated in hay fever attacks. Both plants spread easily from dumped prunings and by bird spread seeds.

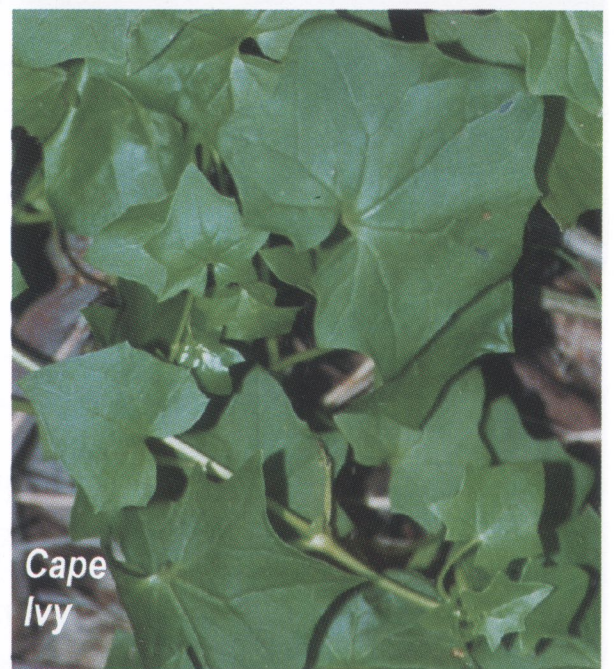
Cape Ivy (*Delairea odorata*) Rapid growth, a scrambling habit, and ability to take root wherever the stem touches the soil make Cape Ivy an ideal ground cover for steep or sloping sites. Unfortunately these traits also make it an excellent invader and its dense bunches of bright yellow flowers are now a common sight in bushland in autumn and winter. Cape Ivy stems break easily when the plant is disturbed, and regenerate from fragments so that it is difficult to control. Careful hand weeding (with repeated follow-up) or spraying with a systemic foliar herbicide (with an additive to increase penetration) are recommended.



Balloon Vine



Honeysuckle



Cape Ivy

Morning Glory (*Ipomoea indica*) has blue-purple flowers with large heart-shaped leaves. The pink or mauve variety (*Ipomoea cairica*), sometimes called Mile-a-Minute Plant, is less common and has a deeply dissected leaf. Both have large funnel-shaped flowers and small black berry fruit. Both are vigorous climbers with hairy stems and large soft green leaves. Morning Glory is spread by birds and other animals which eat the berries, or by dumping. It is declared noxious in many Sydney and coastal council areas.

Balloon Vine (*Cardiospermum grandiflorum*) (picture p.15) is very common along watercourses. Its three-part serrated leaf resembles a grape leaf, and it climbs towards the light using delicate tendrils. Pale green, balloon-like fruit each hold three large black seeds. The balloon becomes papery and turns light brown as it ripens. Balloon Vine can regenerate from root fragments, but not from stem pieces. It is among the most damaging of the introduced vine species, and has been declared noxious by a number of Sydney councils.

Madeira Vine or Lamb's Tails (*Anredera cordifolia*) is a native of tropical South America. Now declared noxious in many Sydney and coastal council areas, it was introduced as a trellis or fence plant but it has escaped to become a major weed of rainforests and moist forests in NSW. Its rope-like twining stem can become quite thick, and it has heart shaped fleshy leaves up to 13cm long. Although a striking feature is its creamy flowers in long drooping catkins or 'lamb's tails', this vine does not reproduce from seed but from large underground tubers and aerial tubers clustered on the stems. When the tubers fall to the ground they shatter. Along creeks they may be buried deeply in silt, sometimes regenerating many years later.

Madeira Vine's lambs' tail flowers

Arrowhead Vine or Turkey Rhubarb (*Acetosa sagittata*) is a vigorous scrambler once used as a trellis and outhouse plant, but now declared noxious in many Sydney and coastal council areas. The bright green leaves are shaped like arrowheads and have a sharp lemony tang. Green flowers appear in summer, gradually changing to red, but are less conspicuous than the small clusters of 3-winged papery pink fruit, which turn pale brown with age. Each winged envelope contains one seed, which is wind dispersed. It is difficult to eradicate because of its many underground tubers, which form as a series of small "potatoes" linked by thin strands. Small plants respond to glyphosate used as a foliar spray, but larger plants must be dug out.

Arrowhead Vine with its small three-winged papery fruit



Morning Glory



aerial tubers

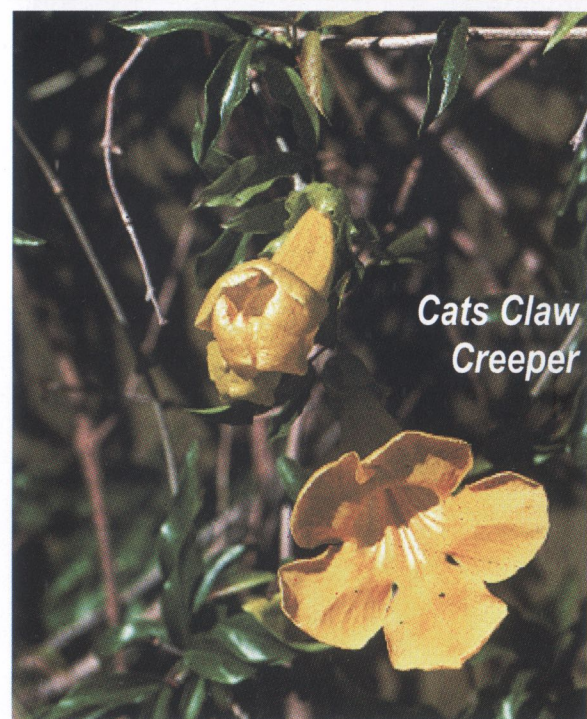


White Moth Plant (*Araujia sericifera*), another old trellis plant, has choko-like green fruit which open to shed masses of white cotton-like seeds. The fibrous material is often used as nesting material by birds, perhaps the reason why it often grows under large trees and on fencelines. Its fibrous roots are shallow and easily pulled out by hand, provided the plant is not anchored in rock or under tree roots. For large plants, find the main stem and sever the top part of the plant, then pull out the main root. Collect the fruit for disposal and leave the rest of the plant *in situ*. When hand weeding, be aware of the viscous white sap which exudes from the stems and leaves. The sap is acrid and causes severe discomfort if it contacts eyes or mucus membranes.



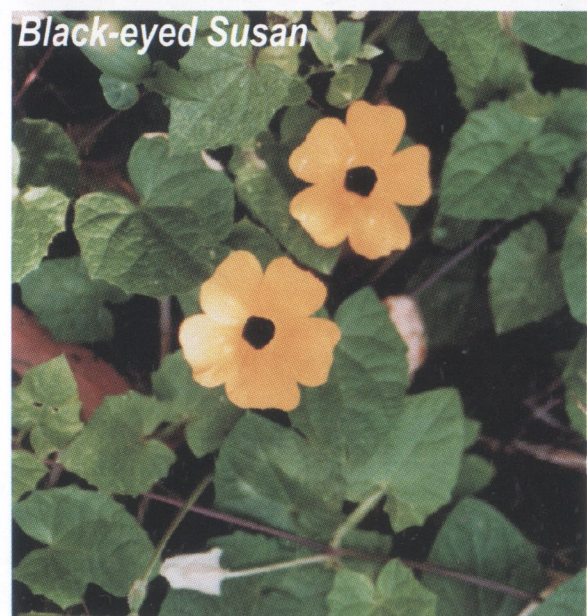
White Moth Plant

Cat's Claw Creeper or Big Mac (*Macfadyena unguis-cati*) is a tropical vine grown for its spectacular yellow trumpet flowers, but like so many other introduced vines, it has escaped cultivation and seriously threatens the integrity of our coastal forests. First a major problem in the rainforests of northern NSW, in recent years Big Mac has gained a foothold in Sydney and the lower Blue Mountains. Any infestation, however small, should be eradicated immediately. The plant has woody stems with climbing recurved tendrils which adhere to any rough surface, leaves with 2-3 leaflets (opposite in arrangement) and huge pendulous pods. Eradication involves removing all stems and roots with their swollen tubers, and making sure the seed pods are collected and destroyed.



Cats Claw Creeper

Black-eyed Susan (*Thunbergia alata*) is a delicate scrambler with pretty orange or yellow flowers and a black throat. It blooms most of the year. Originally from Africa, it rarely sets seed in non-tropical gardens, so this garden escape spreads mainly through dumping, especially in moist soils. To remove, simply locate and dig out the main root mass and collect the scrambling stems for disposal. Still popular in rockeries, and found in older-style gardens, *Thunbergia* is a perennial plant which reproduces easily from fragments, so take care to dispose of cuttings and off-shoot plants in bins, or on the compost heap.



Black-eyed Susan

Eradication

The best method depends on the plant's growth habit. Vines which root at the nodes are easily removed by hand, but the roots at each node must be removed. Vines with a central root mass may be lifted out in one piece. Herbicide spray is effective, but difficult to use if the vines are tangled with native plants. Spraying is also less successful for plants with large underground tubers (Turkey Rhubarb, Madeira Vine) because the herbicide does not penetrate to all tubers and repeated spraying is needed. To use herbicide without spraying, cut a group of stems and dip into undiluted glyphosate for 3-4 seconds or stem-scrape and poison the main stem and each runner. Spot spraying controls seedlings and young plants.

Bulbs, Corms and Tubers

This extraordinary group of plants ranges over a number of families and genera, and includes plants which provide many of our staple foods as well as some of the most beautiful ornamental specimens known.

A striking feature of the group is its tenacity and ability to survive harsh conditions. Modified leaves (bulbs), stems (corms), and roots (tubers) have developed as underground food stores which enable the plant to survive, and when necessary to reproduce without setting seed. Because of this entrepreneurial trait, even single plants may become the nucleus of a new weed infestation.

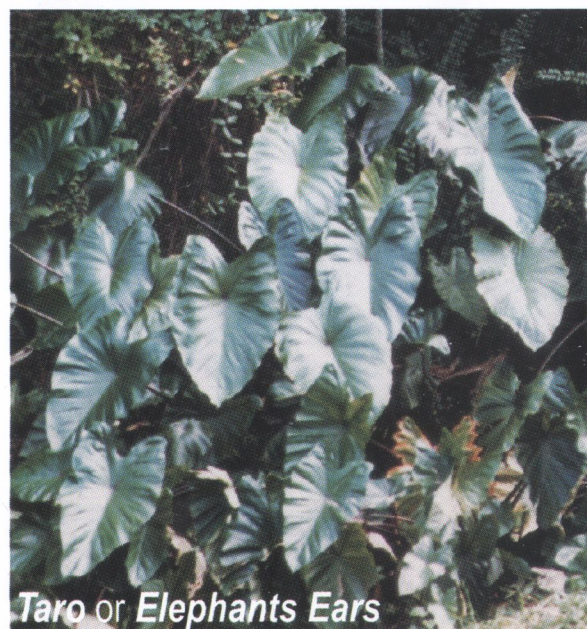
Many common bushland weeds exploit this trait and are quick to take over any damp sunny spot. The orange Montbretia (*Crocosmia x crocosmiflora*), Pink Bugle Flower (*Watsonia angusta*), New Zealand Christmas Bells (*Alstroemeria psittacina*) and white Formosa Lily (*Lilium formosum*), are common plants in drainage ditches and along roadsides. Onion Weed (*Nothoscordum inodorum*) and garden Oxalis may be discarded in lawn clippings and unwanted soil, while Asparagus "ferns" (*Protasparagus* spp.) Bridal Creeper (*Myrsiphyllum asparagoides*), Madeira and Arrowhead Vines, and the variegated Spider Lily (*Chlorophytum comosum*) are often dumped with garden prunings. Throw outs from ornamental ponds such as Elephant's Ears (*Alocasia macrorrhizos*), and Arum Lily (*Zantedeschia aethiopica*), may choke small dams and creeks. Even old garden favourites such as Freesia (*Freesia refracta*) and Daffodil (*Narcissus* spp.) can invade bushland if the bulbs are thoughtlessly dumped.

Eradication

Hand pulling these plants is not successful unless the soil is very moist, because the leaves break away, leaving the bulb in the ground. This group of plants can be dug out, or the leaves wiped with herbicide. Make sure that you take some of the surrounding soil to catch the tiny bulblets and offshoots, especially for severe infestations. Removing leaves regularly from persistent bulbs depletes the food store, but this is a long-term exercise. For control using herbicide, apply late in summer, after flowering, and spray, or wipe the leaves with a weed wand. Treat bulbs immediately after flowering to make sure the maximum amount of herbicide moves down into the storage organ. Repeat in the following season, especially for large infestations.



Canna Lily



Taro or Elephant's Ears



Montbretia

The Turf Grasses

Kikuyu Grass (*Pennisetum clandestinum*)

Common Couch (*Cynodon dactylon*)

Buffalo Grass (*Stenotaphrum secundatum*)

Widely used in agriculture, landscaping and erosion control, turf grasses create serious problems when they invade the bush. Unlike most native grasses, which grow in tussock or open-clump formation, turf grasses form a dense sward on the surface, while the root system grows into a mass of intertwined rhizomes - ideal for retaining loose soil and outcompeting other plants. With sunlight and bare soil, turf grasses invade bush at any vulnerable point: along tracks, fire trails and service corridors, from ovals, picnic areas and gardens. Kikuyu is often planted in clearings and on disturbed sites to control erosion, but once established, it invades along edges, even scrambling over shrubs and young trees.

Grass seeds are spread by birds, ants, wind and water. Grasses also grow from cuttings and runners. You may think dumping grass clippings into bush fertilises the soil and is a harmless practice. Not so! Dumping introduces seeds and runners.

Eradication

Digging out turf is a hard job. First 'scalp' the soil with a sharp spade to sever the root system. Then rework the area to remove leftovers. Treat regrowth with herbicide or spray glyphosate at 1:150-1:200, but note that repeat treatments will be necessary. Spray only in cool, still conditions. The herbicide is absorbed where the leaf blade joins the stem, so spray from above, into the centre of the plant for best penetration.

Agapanthus or Lily of the Nile

(*Agapanthus praecox* ssp *orientalis*)

A very popular landscaping plant with spectacular globular flower heads in blue, mauve or white, Agapanthus spreads vegetatively to form thick clumps that often outgrow their allocated place in the home garden. The robust fleshy root system and the thickened strap-like leaves ensure that the plant is hardy in dry hostile conditions, which means that unwanted plants dumped into the bush will survive and naturalise. The plant is also easily grown from seed. Flowering through summer, each flower produces many small black hard-coated seeds which are held in a three-sided capsule.

Eradication

Digging out unwanted plants is relatively simple, but be sure to collect all thickened root parts and all flower heads, and dispose of them carefully.



Kikuyu Grass has distinctive white stems



Agapanthus

Cacti and other Succulents

In spite of their diversity of form, all succulents have one thing in common: the ability to store water in their leaves, stems or roots. Some, like Cacti, are native to the Americas, but succulents are cosmopolitan in their distribution. Their ability to withstand extreme conditions and to regenerate from even tiny portions of the parent plant enables them to survive and to naturalise when they are dumped into the bush.

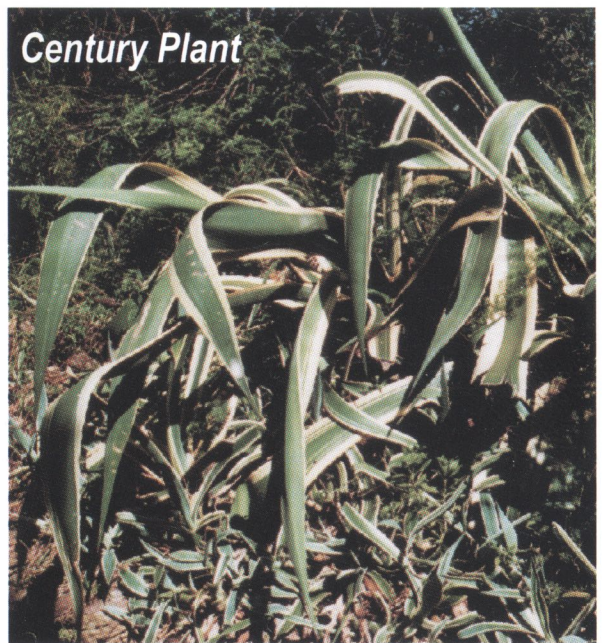
Ornamental succulents come in a wide variety of sizes, from the Giant Century Plant (*Agave americana*), the Yucca and Aloe with their thick fleshy leaves, and Mother-in-Law's Tongue (*Sansevieria grandis*), to the small "hen and chicken" Sedums and Mother of Millions (*Bryophyllum tubiflora*). There are now many other potted ornamental succulents and cacti which, even when they appear dead, many revive and regenerate with rain if dumped in the bush.

"Prickly Pear" (*Opuntia* spp.) is the common term for many cactus species. Of more than 800 species, only 9 are considered weedy. Tiger Pear is the major problem in NSW. First imported from the Americas over 200 years ago to nourish the cochineal beetles which produced red dye for military uniforms, Prickly Pear is still scattered over more than one million hectares in NSW where its sharp spines cause serious damage to stock and humans.

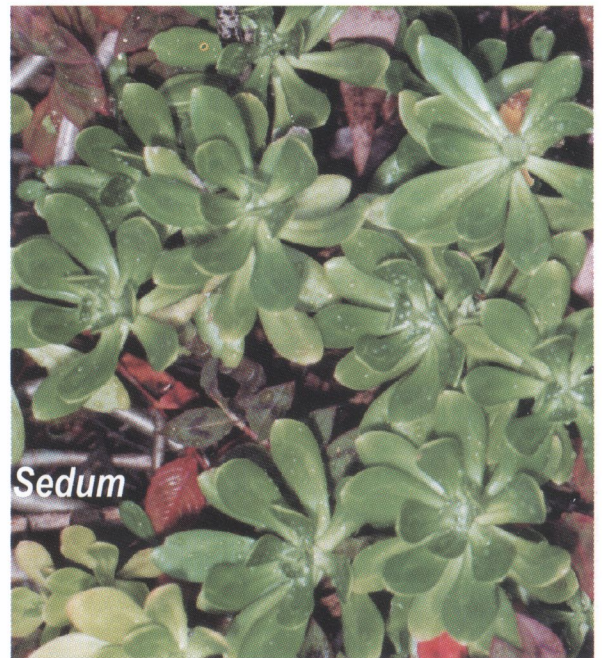
Most Cacti are formed of numerous smooth segments covered with sharp barbs, which attach easily to passing animals or vehicles. They shatter easily, and the pieces can be distributed widely by floodwaters or even wind. Most Cacti naturalise in local bushland after pieces are dumped with garden rubbish. As their tissue contains a great deal of water, fragments may remain dormant in dry soils for many months, only to regenerate with the next rain.

Eradication

Herbicide is not effective in controlling succulents as the plant 'juices' dilute the poison. Small plants can be sprayed, although repeat treatments may be necessary. Large specimens or isolated plants can be dug out. A very hot fire is often effective in controlling large infestations in rural areas and also disposes of the debris. Remember that succulents grow from fragments, so always dispose of the debris carefully! Be particularly careful when removing cacti. Injury caused by the sharp spines may require surgery and the sap produced by some species (e.g. Aloe, Agave) may burn and ulcerate the skin.



Century Plant



Sedum



Mother of Millions is a tiny plant but it spreads very easily and rapidly

Wild Ginger or Ginger Lily

(*Hedychium gardnerianum*)

Ginger Lily is a spectacular garden plant with long strap-like leaves and large spikes of perfumed yellow and orange flowers up to 25cm long. Unlike its close cousin, the cultivated Ginger, this species is not edible.

The underground parts of the plant form a large fleshy rhizome, which may run close under the soil surface for a metre or more. Growing buds are located at intervals along the rhizome, so that many leaf and flower stems arise from a single stem. Like most rhizomatous plants, the spread of Ginger Lily into bushland occurs through dumping.

Eradication

To remove, expose the thickened rhizome just under the soil surface. Cut along both sides with a sharp knife. Lift the plant out and dispose of it carefully. Even small sections left in the soil can regenerate to form new plants



Ginger Lily in flower

Bamboo

Clumping Bamboo

(*Arundinaria pachymorph*)

Rhizomatous Bamboo

Golden Bamboo(*Phyllostachys leptomorph* var. *aurea*)

Black Bamboo (*Phyllostachys nigra*)

The Bamboo family is a large group of over 200 woody tussock-forming perennials. In Australia they are grown as ornamentals, but elsewhere they are used for building, paper, weapons, musical instruments and food. Bamboos are closely related to the grass family. The long strap-like leaves are yellow-green with parallel veins, but there are also variegated and dwarf forms. Bamboo rarely flowers in Australian conditions. It steadily increases in size by vegetative growth from the root mass.

There are two common forms of Bamboo: a clumping variety (*Arundinaria*) and a rhizomatous variety (*Phyllostachys*). Both known as 'Bambusa'. Clumping Bamboo spreads slowly from the centre, but it is the rhizomatous Bamboo which spreads rapidly and causes most problems, often lifting patios and cement paths, and invading sewer pipes. It causes similar havoc in the bush.

Eradication

Bamboos have a dense, almost impenetrable and tenacious root system. Never plant bamboo in your garden. If you have to have it, keep it in a big pot! Canes can be cut and poisoned, but treat each stem. You can dig it out, but you must remove all rhizomes/ roots. Bamboo is noxious in many Sydney council areas.



Golden Bamboo

Aquatics or Water Weeds

Aquatic plants play a vital role in the food chain, forming the backbone of wetland areas and providing food and shelter for a wide variety of animals. Aquatics weeds in our waterways cost taxpayers millions of dollars annually. Most were introduced as aquarium or horticultural plants, but have spread widely in irrigation and flood control systems. They restrict the recreational and commercial uses of waterways.

Four aquatic weeds are declared noxious Australia-wide: *Salvinia* (*Salvinia molesta*); Water Hyacinth (*Echhornia crassipes*), Alligator Weed (*Alternanthera philoxeroides*); and Lagarosiphon (*Lagarosiphon major*). Aquarium "throw outs" such as Canadian Pondweed (*Elodea canadensis*), Oxygen Weed (*Egeria densa*), Water milfoil (*Myriophyllum spicatum*) and Arrowhead (*Sagittaria sagittifolia*) are also serious problems.

Commonly found in garden ponds, and voted the world's worst waterweed, **Water Hyacinth** is a free-floating plant joined by runners or stolons. Each plant bears a clump of leaves on a short stem and produces a lilac-blue flower. Seed germinates in shallow water or mud, and may remain viable for 20 years or more. Hyacinths also reproduce from broken pieces of stolon, spread by floodwaters.

In contrast, **Salvinia** is a free-floating fern with trailing "roots". The fronds or "leaves" are oval and flat in small isolated plants, or heart-shaped or oblong and deeply keeled when crowded. *Salvinia* drifts on the surface, forming dense mats which cut off light and oxygen to pond dwellers below, eventually changing the pond ecosystem. *Salvinia* produces no seeds. It reproduces from broken pieces of stem, with infestations capable of doubling in size every 3-5 days. It is easy to harvest by hand.

Elodea is a submerged plant, which roots in gravel and silt. It flowers in summer, floating to the surface to be pollinated. The brittle stems grow up to 3m long, bearing whorls of thin green leaves. Its stems break up in late summer, producing many small plants. A long-time favourite in home aquariums, *Elodea* is a great survivor, living in both tropical and cool waters.

Eradication

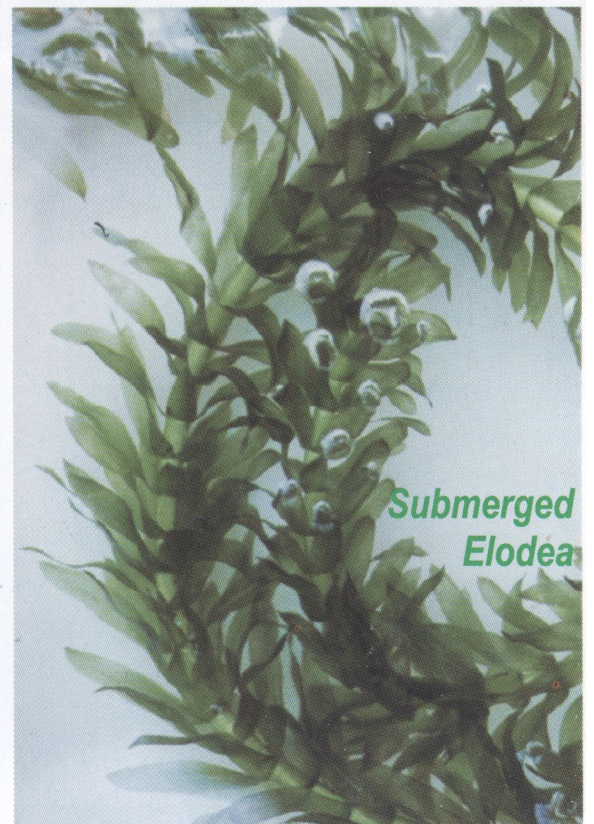
Aquatic weed control combines chemical, biological and physical techniques (integrated weed management). Small areas can be controlled more simply. First identify the weed; then select the best method - dredging, raking, netting, draining the pond, or careful use of selective herbicides. Using herbicide near water is dangerous, using herbicide in water is illegal without a permit. For help, always contact your council's Noxious Weeds Officer, NSW Agriculture or the Environmental Protection Authority.



Salvinia on the water surface



Water Hyacinth in flower



Submerged Elodea

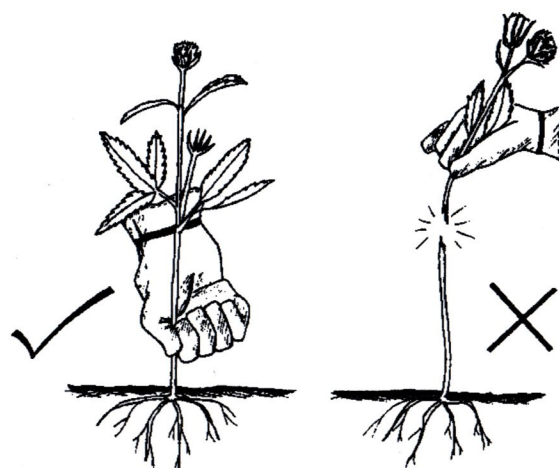
Eradication Methods

This section describes 'tried and true' methods for controlling weeds. The hand weeding approach, using simple tools, is described first, followed by a separate section on the safe use of herbicides. Whatever approach you use, it is crucial to follow-up initial weeding to control regrowth before the weeds mature and set seed again. To avoid unduly disturbing the soil (and encouraging new weeds), replace soil in the hole left by the weed and mulch with leaf litter. Most weeds can be successfully composted, but do not include plants with bulbs, corms, large tubers or succulents like Wandering Jew, Cape Ivy or Mother of Millions.

1. Herbaceous Weeds and Woody Weed Seedlings

Using your Hands

Most herbaceous weeds and other seedlings are shallow-rooted and easy to pull out if the soil is sandy or damp. The aim is to get the whole plant out without breaking the stem or roots. Locate the base of the stem and grasp firmly, rocking the plant gently to loosen its grip. As it 'gives', pull straight up (not at an angle). Go with the natural line of root growth. For larger plants, or those with deeper roots, excavate around the main stem or use pliers to get a better grip. If the plant breaks, follow the broken root down and dig it out. Examples are Purpletop, Fleabane, Crofton Weed, Cobblers Peg, Ragweed, small tufted grasses (eg. Briza) and woody weed seedlings such as Privet and Lantana.



Using a knife or garden trowel

Some weeds, such as Dock, Thistle, Catsear, Paterson's Curse, Plantago, Coreopsis, Purpletop and Fennel, develop a deep taproot or a swollen rhizome which will not come out of the soil in one piece if pulled. To remove, use a knife with a short sturdy blade or a narrow 'bulb' trowel to loosen the soil. A knife works best in sandy soil, while a trowel is recommended for heavier clay soils.

Push the knife or trowel into the soil right next to the main stem and gently push the handle back and forth towards the plant. Then grasp the base of the stem with your other hand and pull. If the plant doesn't come free, repeat this action right around the plant, which will effectively free it from the soil. Avoid a 'sawing' movement, which will blunt the blade.

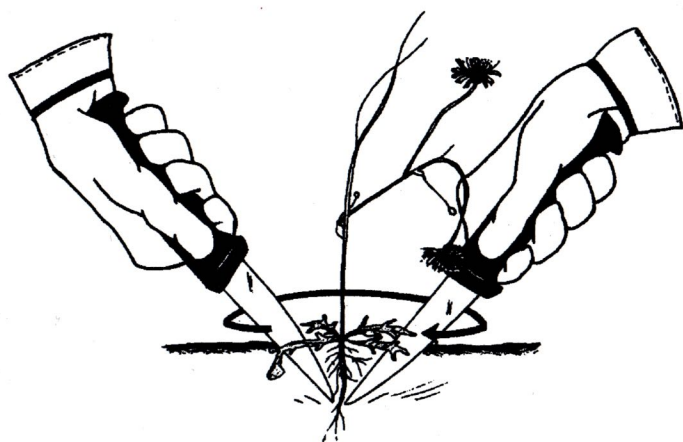


Using the "Pudding Basin" cut

This is a useful way to remove weeds with a central root mass (Jasmine, Morning Glory), thickened rhizomes (Ginger Plant, Pampas Grass), corms (Asparagus 'ferns', Montbretia), tussock grasses (African Love Grass, Paspalum) and woody weed saplings.

Using a very sharp knife, insert the blade close to the base of the plant. Push the knife down to its hilt while angling the blade slightly and keeping the knife tip under the base of the plant. Push down hard and move the knife back and forth in an arc. Repeat this action around the whole circumference of the plant. When the plant is freed at the sides, grasp the top growth and gently tilt the plant, then run the knife underneath, severing the basal roots. Lift the plant out of the ground, using your trowel to clean up any broken roots or rhizomes. If your knife is blunt, this approach will not work.

For really large plants like Pampas Grass, Arundo or Bamboo, substitute a sharpened mattock and a crowbar (or jemmy) for the knife or trowel. To avoid eye injury, remove the leafy top growth before starting work. However, the 'cut and dab' herbicide method is an easier treatment for these larger plants. It creates less soil disturbance and ensures death to underground roots.



Imagine you are cutting around a bowl or pudding basin.

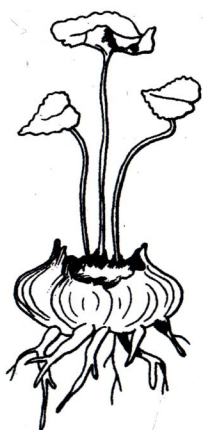


Keep your knife sharp!

2. Plants which Spread from Underground Reproductive Parts

Most plants with underground reproductive parts (bulbs, corms, rhizomes and tubers) can produce new plants without setting seed. New plants grow from spreading underground roots (rhizomes and tubers) or small offshoots are formed on the parent body, which may fall off when the plant is disturbed (bulbs and corms). The result is a carpet of new plants. Oxalis and Onion Weed are perfect examples.

Corm -
Modified stem



Bulb -
modified leaves



Tuber -
modified rhizome



Fishbone Fern
grows from
spreading rhizomes



To control these plants, move systematically through the area to be treated, working the soil between your fingers (or you may prefer to use a soil sieve). Remove each plant and its offshoots. If necessary, remove some of the surrounding soil with a trowel or spade to capture tiny offshoots. Monitor for regrowth and remove seedlings as they appear.

Where these plants are growing amongst other plants you don't want to disturb, carefully wipe the leaves with glyphosate, taking care not to get any on other plants. Do this early in the growth of the plant, before the new offshoots have formed and separated. If herbicide accidentally spills on a neighbouring plant, wash it off immediately or break off the leaf.

3. Woody Weeds

Plants which layer to form thickets

Plants such as Blackberry, Lantana or Bitou Bush sprout laterals or side runners which take root when they touch moist ground. The resulting thickets are hard to get at and hard to treat. Removing layering weeds by hand with a mattock or spade succeeds only if you work systematically through the thicket, removing each runner as you come to it. The runners often grow entwined with other plants, but if you treat the main infestation first, after a few months it will be relatively easy to see what you have missed. Layering woody weeds are best treated using a combination of digging (to remove main roots) and herbicide treatment (cut and paint the laterals).

As the flexible stems may snap back when pulled, avoid eye injury by wearing safety goggles. Using loppers, secateurs or a bush saw, begin by removing the top growth from the main bush. When the main stem is revealed, excavate and cut the lateral roots away. Use a crowning or 'pudding basin' cut to sever side and basal roots. Remove the stem bole and any laterals within reach. Then, systematically work around the main plant locating the runners. Dig the runners out or you may wish to treat each cut-stump with herbicide, which means that you don't have to disturb the site further. Be sure to remove all weed debris as even cut stems can send out new roots.

Blackberry - a new plant forms where a stem touches the ground



Plants with tap roots or tap and lateral roots

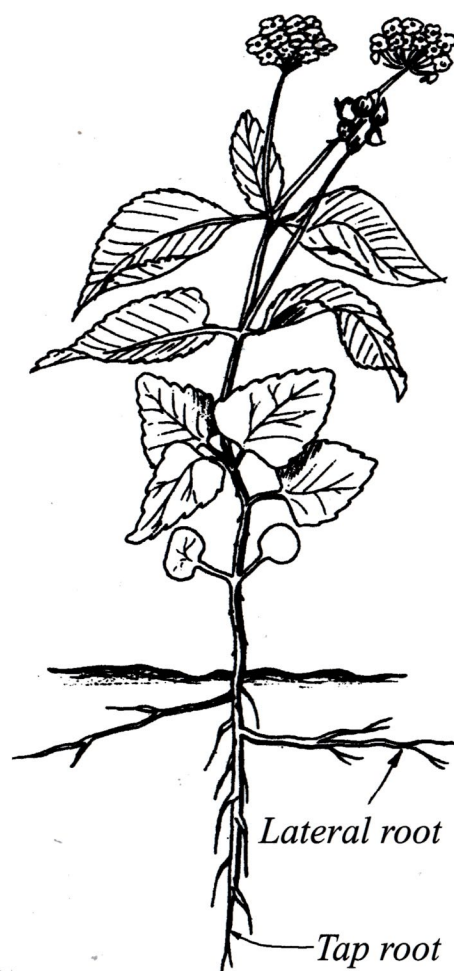
Plants with tap roots such as Ochna, Senna (Cassia), pine trees, Cape Broom, Tobacco Bush, Cestrum, Castor Oil, Paddy's lucerne (Sida), or with tap and lateral roots such as Bitou Bush, Privet, Camphor laurel, Lantana, African Olive, Cotoneaster, Pyracantha, Rhus, Gorse and Scotch Broom (Cytisus) have thickened taproots for food storage and will always re-shoot unless removed completely. Only attempt to hand pull weeds with taproots when they are very small and/or the soil is soft after rain.

Choose tools to suit the size of plant and make sure they are sharp. Use safety goggles, or an old pair of sunglasses to protect your eyes. If the plant is large, cut off the top portion for better access, but leave the stump long enough to act as a lever. Remove the debris and push back the surface mulch to give you a clear workspace.

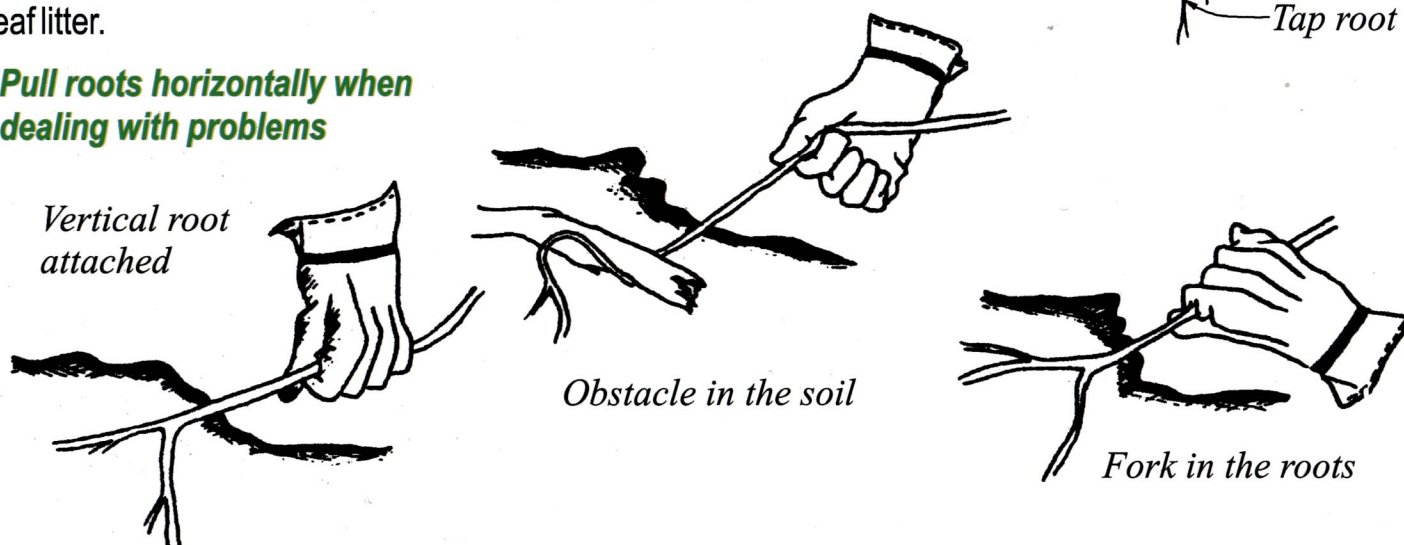
Dig down next to the main root, excavating the soil and piling it in layers nearby. When the main root is fully exposed pull it gently towards you and determine the direction of growth. Check to see if there are any lateral roots attached.

Remove lateral roots first. Cut close to the base of the stem and pull each lateral root from the soil carefully, using long-nose pliers for a better grip (or cut and dab). If necessary, excavate and follow each root along its length. Cut any twisted roots and trace them out. Remember to keep your hand close to the ground and pull roots horizontally. If a root goes under a rock or is twisted with another root, cut it off and note its location so that you can trace it out later. Tiny fibrous roots can be left in the ground.

When all lateral roots are cut, rock the stump gently back and forth, excavating as you go. Use a crowbar for large plants. Replace the soil in the same order: subsoil first, then topsoil, packing it firmly. Replace the leaf litter.



Pull roots horizontally when dealing with problems



4. Vines, Climbers and Scramblers

Possibly the most destructive group of environmental weeds on the East Coast, vines and scramblers kill trees, shrubs and ground-dwelling herbs by cutting off sunlight and smothering new growth. As the root systems and reproductive methods vary widely between species, it is important to identify the weedy plant you want to remove. To be successful, control methods must be appropriate to the growth form of the plant.

Climbers and scramblers with a central root mass

When vines have invaded the tree canopy, remove them by cutting through the climbing stems around the lower trunk, and then dig out the whole root mass. Some vines will have underground tubers (eg. Turkey Rhubarb, Madeira Vine), so these must also be dug out too. Aerial stems can safely be left in the tree, but vines with fruit (eg Balloon Vine) or aerial tubers (eg Madeira Vine) require special treatment (herbicide

application), or constant monitoring and follow-up weeding to remove seedlings as they appear.

When vines and scramblers grow close to the ground, in a thicket or tangled with other plants, you need to use careful hand weeding to separate the weeds from natives. Locate the direction of growth by pulling gently on each runner, and working from the outside of the thicket, cut and remove lengths of stem. To avoid breakage, always pull runners towards you. Locate the main root mass and dig it out, using a crowning cut to sever all side and basal roots. All stem pieces and roots must be bagged and removed from the site. After a few months check for regrowth and missed plants.

Climbers and scramblers that root at the nodes

The node is the part of the stem which gives rise to a new leaf or root (a growing point). Many weedy vines and scramblers grow new plants wherever a node touches moist ground. Such plants may have surface runners or stolons (eg Honeysuckle, Jasmine, English Ivy, Morning Glory), or underground runners (rhizomes) (eg Couch Grass, Kikuyu, Buffalo Grass and Fishbone Fern).



To remove plants with rooted nodes, begin at the central root mass, working outwards along each runner. Remove the root mass in the usual way, then follow each runner. If the infestation is really dense, you may have to start from the outside. Test the direction of the runner by pulling gently. When you reach a rooted node, run a sharp knife underneath the runner to sever the roots. Check for missed broken pieces of stem and root. Small fibrous roots can be safely left in the ground, but collect all the main roots and runners and bag them for removal. Big thickened rhizomes (eg Ginger Plant) can be cut down each side, and lifted out in several pieces. Hint: wind runners around your hand or arm as you work, and hang the 'halo' in a nearby tree to dry..

Climbers and scramblers with brittle stems

Plants which form thick mats like Wandering Jew can be raked into piles and covered with black plastic to accelerate decomposition. If it grows on a hard, even surface (like rocks) the weed mat can be cut into sections and rolled up like a carpet. Hand pull missed fragments and check monthly for any regrowth.

Kalanchoe and the Sedums can regenerate easily from their fleshy leaves, as well as from stem fragments. Remove these plants carefully and bag all debris. Most succulents will shatter when pulled, so removing some of the soil around the plant is a good idea. Small succulents growing on rocks are best removed with a trowel or spade, baring the rock underneath.

Wandering Jew on an even surface can be rolled up like a mat

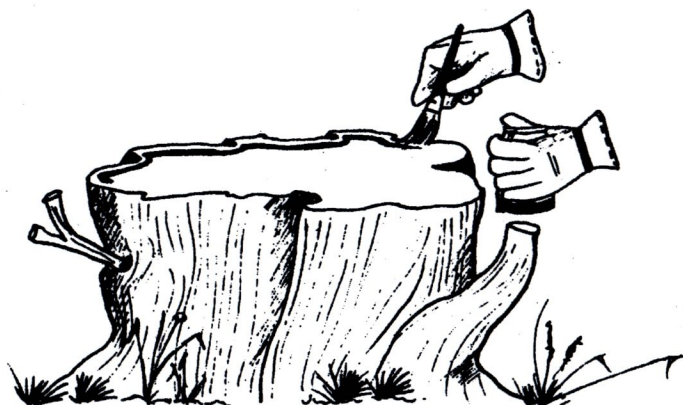


5. Using Herbicides Safely

An environmentally 'soft' or biodegradable chemical is glyphosate, marketed as Roundup, Zero (in a diluted form) or Glyphosate 360. Glyphosate is a systemic herbicide which, once in the plant's sap system, travels throughout the plant body to achieve a total kill. Be aware that glyphosate will kill any plant if it comes into contact with the leaves or green stem. It has no effect on seeds in the soil; so follow up weeding is always essential. Glyphosate is designed as a foliar (or leaf-applied) herbicide, although it may be put directly into the plant's sap system through tree injection, frilling or the cut and dab (cut-stump) method.

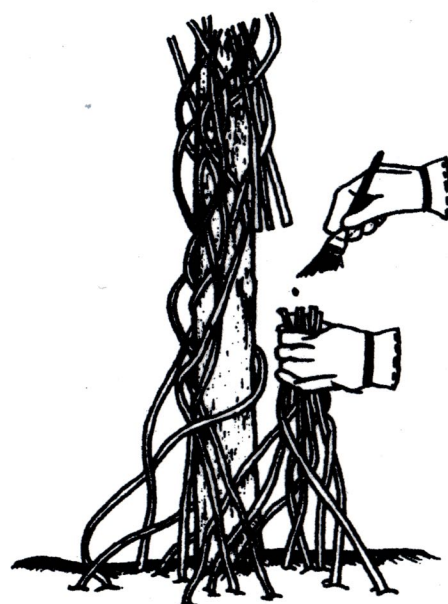
Cut and dab or 'cut stump' method

For woody weeds this technique involves poisoning of the root system and removal of the top growth in one operation. Cut the stem or trunk at a slight angle, using loppers, bushsaw or chainsaw. Cut close to ground level. For hard to kill weeds (eg Ochna, Camphor laurel), scour the side of the stem with a knife to expose the sapwood tissue, and wipe this area with herbicide as well. Sawdust or dirt should be wiped off as this will absorb some of the herbicide and reduce its efficacy.



Immediately apply undiluted glyphosate to the cut stump using a paintbrush or small spray bottle. Apply to the outer rim (sapwood) only. Painting the centre of the stem (heartwood) is ineffective and wastes herbicide (except for Privet - paint the whole wound). If the delay in application is more than about two minutes, recut and paint the fresh wound. If the tree resprouts, you must first remove all the growing shoots, then recut the stems and reapply the herbicide.

A variation of this method can also be used on vines. Gather a bunch of stems near ground level, cut through and paint the lower cut ends immediately with herbicide. There is no need to paint the upper ends as these stems will die anyway.

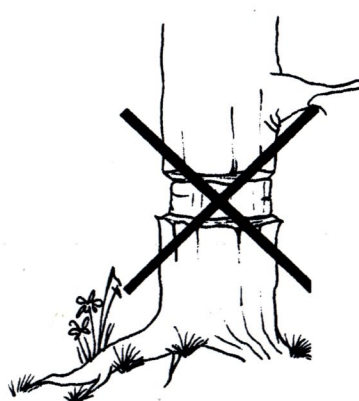


Cut and paint

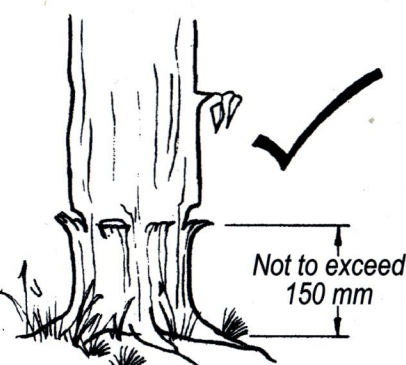
Frilling or chipping

Use a small axe, hatchet or sharp chisel to wound the stem. Peel off the bark and expose the sapwood tissue, which lies directly underneath. If the tissue looks wet or moist, you have exposed the sapwood. Use a paintbrush or any non-drip applicator to apply herbicide to the raw wound.

A common mistake is to ringbark the tree by making a circular cut right around the stem. This breaks the shoot-to-root pathway so that the herbicide cannot get down to the roots. Ringbarking kills trees by starving the roots of food, which is manufactured up in the leaves. It is not necessary to use herbicide when ringbarking - it kills the tree quite nicely on its own.

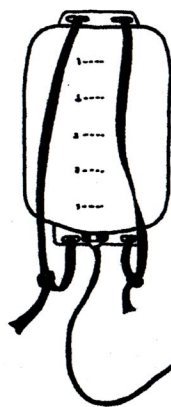


Frill ring



Tree injection

Use a brace and bit or cordless drill to make shallow holes at an oblique angle. Drill into the sapwood only. When treating coppicing or multi-stemmed plants you must drill into each stem separately. Treat one stem at a time. For larger stems, drill holes every 5cm around. Do not ringbark the stem. Blow out the sawdust before adding the herbicide to the hole. Place a measured dose (usually 1-2ml is sufficient) in each hole using an eyedropper, injection gun or hypodermic syringe. There is no need to plug the hole afterwards.

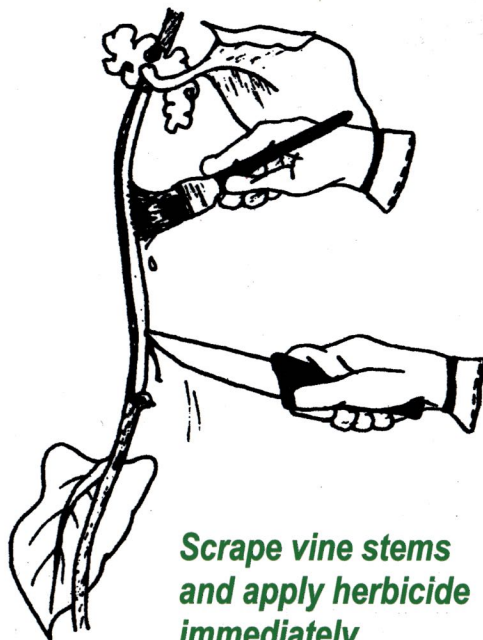


Tree injection using a cordless drill and herbicide from a backpack.



Stem scraping

Use for vines with aerial tubers, such as Madeira Vine so that the tubers are killed by the herbicide. Herbicide will travel to the aerial tubers and kill them before they fall off. Any tubers that fall from the plant in the stem scraping process should be bagged and removed. Lightly scrape 15 - 30cm length of stem to expose the moist layer below the bark. Do not ringbark.. Apply herbicide immediately along the length of the scrape and leave vines hanging after treatment.



Scrape vine stems and apply herbicide immediately

Foliar or leaf spraying

Diluted glyphosate can be applied to leaves by weed wand or spot spraying. Spraying is useful for control of unwanted grasses and other herbaceous weeds. If spraying, choose a warm day when the air is still. Use reliable equipment, avoid direct contact with the chemical, and wear protective clothing.

Like most herbicides, glyphosate works best on a healthy plant. Use herbicide only when the plant is actively growing - usually in warm sunny weather. Do not treat a sick plant or one under stress from heat, cold or drought. Generally, treat annual weeds early in the season when they are growing the fastest. Treat perennials (including bulbs) after flowering and before fruit sets (usually late summer or autumn) when there is maximum movement of food material down to the root system. This is the ideal time for reaching the roots with poison. **If a desirable plant is accidentally sprayed, wash immediately with fresh water, throw a handful of dirt onto the sprayed surface, or quickly cut off the affected leaf or branch.**

ALWAYS FOLLOW THE INSTRUCTIONS ON THE LABEL

The instructions have been included to help and protect you. If the weed you are trying to control is not listed on the label, or the suggested dosage rate does not appear, contact the Registrar of Pesticides at the Environmental Protection Authority for assistance.

NOXIOUS WEEDS AND ENVIRONMENTAL WEEDS

What is a noxious weed?

Many people describe anything that causes a problem in their gardens as a noxious weed (or even 'obnoxious'). But a **noxious weed** is not just a nuisance plant - it has a real meaning in law. Noxious plants are identified and listed under the **Noxious Weeds Act 1993**. This means that the landowner (whether a private individual, local council or a State government agency) has a legal responsibility to control noxious weeds on their own land, or face a substantial fine.

A **noxious weed** is a plant that causes serious economic loss to agriculture by damaging or contaminating crops or blocking waterways, or one that has a detrimental effect on man, animals or the environment. Prior to the 1993 Act, only weeds directly threatening agriculture or human health were declared noxious. Now, if plants are recognised as causing serious harm to the environment, they too may be declared noxious. For example, Pampas Grass is a major weed in commercial forests, but it also invades bushland and wetlands, and for all these reasons it was declared noxious in 1986.

On the other hand, plants such as Privet, Bitou Bush, Gorse, Montbretia and Morning Glory are well known weeds of bushland, but rarely cause problems for agriculture. Often called bushland or **environmental weeds** many such bushland invaders are also declared noxious in areas where they cause major problems.

Noxious weeds are listed on a local government (council) basis. As many of the environmental weeds are restricted to wetter coastal regions, they are not declared in other parts of the State. It is a Council responsibility to nominate species in their area for inclusion under the Act so that noxious weeds do not have a consistent listing throughout the State. If you are not sure whether a plant is declared noxious in your area, contact the Noxious Weeds Officer or the Bushcare Officer at your local council.

Unfortunately, many plants regarded by the general public as **environmental weeds** are not listed as **noxious** under the Act. This may be because they are not considered to pose a real environmental threat, or because council has not been able to allocate resources to prepare a nomination, or perhaps because the plant has naturalised to such a degree that there is no economic way to control it. There is little point in declaring a plant as noxious if there is no known method of control, or if the cost would be exorbitant.

Yet some plants provide such a threat to our environment that, despite the costs involved, control is considered vital. Many aquatic weeds are declared throughout the State as they have the potential to totally overtake our waterways and cause irreparable damage to both agriculture and the environment. Alligator Weed and Water Hyacinth are two aquatic weeds that are considered so damaging that many millions of dollars are spent each year on research and control programs.

At the time of publication, the *Noxious Weed Act* lists noxious weeds in one of four categories. Categories 1-3 are mainly agricultural weeds or those harmful to human health, while Category 4 lists many of the environmental weeds that invade bushland habitats. Noxious weeds are grouped according to the actions required to control them.

The *Noxious Weeds Act* is currently being reviewed and it is not known if the four-category system will be retained. However, the responsibility of identifying and nominating noxious weeds and for enforcing the Act will remain with local councils. An updated list of noxious weeds is published yearly in the Government Gazette, but copies are available from NSW Agriculture and from your local council.

Remember - If you are a landowner with noxious weeds growing on your property, you are legally required to control them.